Water Quality Planning Bureau

Montana EQuIS Water Quality Exchange (MT-eWQX) Guidance Manual

January 2022
WQPBDMSTECH-24
Version 4.0

Water Quality Planning Bureau
Water Quality Division

Table of Contents

DOCUMENT REVISION HISTORY

Version #	Revision Date	Revised By	Notes
1.0	6/1/2009	Jolene McQuillan	Initial document development
1.1	10/9/2009	Jolene McQuillan	Updates to entire document
1.2	10/21/2009	Jolene McQuillan	Updates to 4.1 and 5.2
1.3	10/27/2009	Jolene McQuillan	Updated screenshot for 2.4.2 and text for 2.1
1.4	11/2/2009	Jolene McQuillan	Updates to 2.2, 2.4.2, 2.4.3, and 5.2.1. Added section 4.2.1
1.5	11/10/2009	Jolene McQuillan	Updated 3.2.5
1.6	12/18/2009	Jolene McQuillan	Updated 3.2.5
1.7	12/30/2009	Jolene McQuillan	Updated 1.0 and added blank page after title page
2.0	1/7/2010	Jolene McQuillan	Added Appendix A and moved information specific to the EDP to the EDP Guidance Manual.
2.1	1/15/2010	Jolene McQuillan	Updated 3.2.5 (added Particle_Size_Basis field)
2.2	4/12/2010	Jolene McQuillan	Updated portions of 3.0 and 5.0. Updated Figure 1-1. Added Figure 5-1.
2.3	6/28/2010	Jolene McQuillan	Updated text in 3.2.4 and 4.1. Added section 3.3
2.4	10/14/2010	Jolene McQuillan	Added section 3.4
2.5	11/18/2010	Jolene McQuillan	Updated Chlorophyll-a info in Appendix A and section 3.3
2.6	1/6/2011	Jolene McQuillan	Updated Chlorophyll-a info in Appendix A
2.7	3/18/2011	Jolene McQuillan	Updated Chlorophyll-a section in Appendix A
2.8	4/20/2012	Jolene McQuillan	Updated field measurement methods and chlorophyll-a info in Appendix A.
2.9	4/1/2014	Jolene McQuillan	Updated Appendix A
3.0	1/12/2015	Jolene McQuillan	Updated section 2.2 for v6 of Enterprise
3.1	2/23/2017	Jolene McQuillan	Updated Appendix A with new nutrient characteristics
3.2	5/15/2018	Jolene McQuillan	Updated DEQ logo
3.3	1/13/2021	Jolene McQuillan	Updated links to webpages and new Enterprise site
4.0	1/25/2022	Katie Makarowski	Revised and reformatted entire document plus associated MT-eWQX EDD Format. Streamlined instructions and edited for clarity to improve usability for external data providers. Updated flow diagrams. Removed unnecessary initial set-up steps including EQuIS Enterprise account registration. Removed three worksheets (Alternate Monitoring Locations, Biological/Habitat Index, Biological/Habitat Metric). Clarified Quality Control instructions. Revisions were made in consultation with Deanna Tarum (DEQ Water Quality Data Manager) and Jolene McQuillan (DEQ Sample Data Management Coordinator) and with input and review by Adam Sigler (MSU Extension Water Quality) and Rachel Malison (U of M Monitoring Montana Waters).

Suggested citation: Montana Department of Environmental Quality (DEQ). Montana EQuIS Water Quality Exchange (MT-eWQX) Guidance Manual. WQPBDMSTECH-24, Version 4.0. Helena, MT: Montana Department of Environmental Quality, Water Quality Division, Water Quality Planning Bureau.

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND FILE EXTENSIONS

CWA	Clean Water Act
DEQ	Montana Department of Environmental Quality
EDD	Electronic Data Deliverable
EDP	EQuIS Data Processor
EPA	Environmental Protection Agency
FTS	File Transfer Service
HUC	Hydrologic Unit Code
LRL	Lower Reporting Limit
MDL	Method Detection Limit
MPDES	Montana Pollutant Discharge Elimination System
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MT-eWQX	Montana EQuIS Water Quality Exchange
ND	Not Detected
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plans
RPD	Relative Percent Difference
RRL	Required Reporting Limit
SAP	Sampling and Analysis Plan
SRP	Soluble Reactive Phosphorus
STORET	Storage and Retrieval Database
TN	Total Nitrogen
TP	Total Phosphorus
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WQPB	Water Quality Planning Bureau
WQX	Water Quality Exchange
WQP	Water Quality Portal
.pdf	PDF File
.txt	Text File
.xls	Excel File

1.0 INTRODUCTION

The Montana EQuIS Water Quality Exchange (MT-eWQX) database is Montana Department of Environmental Quality's (DEQ) main repository for water quality data. This guidance manual provides detailed instructions for formatting and submitting environmental data to DEQ for storage in MT-eWQX.

1.1 MT-EWQX, NATIONAL WQX, AND THE WATER QUALITY PORTAL

DEQ and other data partners submit water monitoring data to the Environmental Protection Agency (EPA) via the national Water Quality Exchange (WQX) (**Figure 1**). Data uploaded to Montana's MT-eWQX database is sent to the national WQX database approximately weekly. Grant recipients or contractors collecting environmental data using federal Clean Water Act (CWA) funding sources, including 319, 604, or 106 grants, must transmit this data to EPA using WQX and data submittal to MT-eWQX fulfills this requirement.

Anyone can retrieve data that has been submitted to WQX using the Water Quality Portal (WQP), available at https://www.waterqualitydata.us/. The WQP replaced EPA's decommissioned STORET Warehouse and integrates publicly available water quality data from other databases including the United States Geological Survey (USGS) and United States Department of Agriculture (USDA).
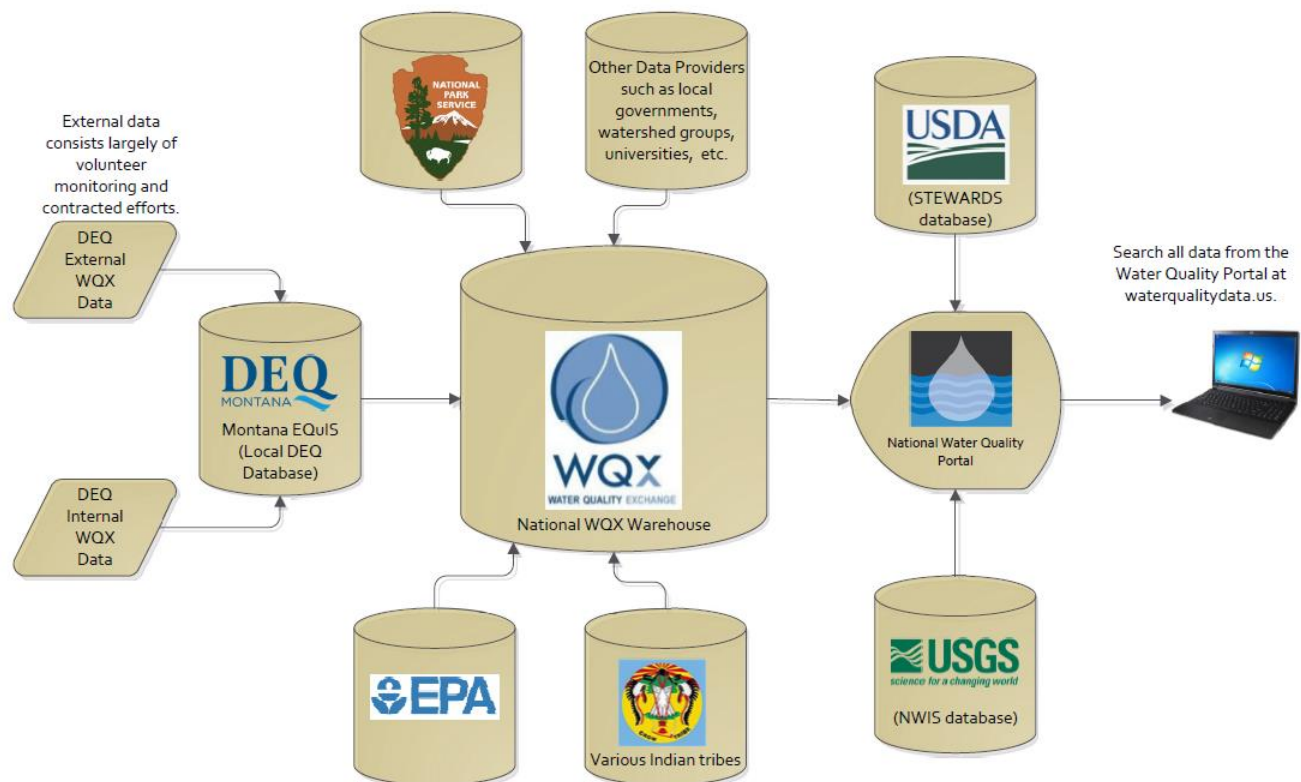

Figure 1. EQuIS (MT-eWQX) and National WQX Warehouse Data Flow *(figure revised 1/21/2022)*

1.2 WQX ORGANIZATIONS

Organizations are high-level groupings of data within MT-eWQX that indicate which entity (or type of entity) collected the data. Organizations can be used to query or filter data from the databases if seeking a certain source of data. Some entities submit data to their own individual WQX organization (e.g., Montana Bureau of Mines and Geology organization "MBMG_WQX", and NorthWestern Energy organization "MTNWE"), whereas some entities are grouped together with other similar entities under a broader WQX organization (e.g., Volunteer Water Quality Monitoring organization "MTVOLWQM_WQX").

DEQ has nine organizations that external data providers frequently submit data to:

- **Montana Watershed Data (MTWTRSHD_WQX)**: This organization is for data collected externally from DEQ using grant monies such as 319 or 106 or managed under a DEQ-approved Quality Assurance Project Plan (QAPP) or Sampling and Analysis Plan (SAP).
- **Montana Volunteer Water Quality Monitoring (MTVOLWQM_WQX)**: This organization is for data collected by volunteer organizations, groups, or individuals.
- **Montana 303d/305b Call for Secondary Data (MT305b_SecondaryData)**: This organization is for data submittals in response to DEQ's biennial 303(d)/305(b) 'Call for Water Quality Data' for potential use in water quality assessments.
- **Montana Pollutant Discharge Elimination System (MDEQ_MPDEQ_WQX)**: This organization is for data associated with MPDES permits.
- **Montana DEQ – Remediation (MDEQ_REM_WQX)**: This organization is for data collected under the direction of Montana DEQ's Waste Management and Remediation Division.
- **Montana NorthWestern Energy (MTNWE)**
- **Tri-State Water Quality Council (TSWQC_WQX)**
- **Montana Bureau of Mines and Geology (MBMG_WQX)**
- **PPL Corporation (MONT_PPL_WQX)**

1.3 ELECTRONIC DATA DELIVERABLE (EDD)

Environmental data submitted to MT-eWQX must be in a specific electronic format known as an Electronic Data Deliverable (EDD) (**Section 2.3**). Data providers must download the MT-eWQX EDD template, populate it with their project data, validate their EDD, and submit it to DEQ. Creating an EDD often involves compiling results from analytical laboratories or biological contractors together with data that was recorded or measured in the field:

- Analytical laboratories and biological contractors provide an electronic data package which typically consists of lab reports, a Quality Assurance/Quality Control (QA/QC) summary report, and an EDD containing analytical result values and associated metadata. **NOTE**: To streamline data entry and minimize the need for manual reformatting, DEQ recommends that data providers confirm in advance that the labs they plan to use are willing and able to provide EDDs that meet MT-eWQX formatting requirements. DEQ provides guidance to labs as they set up MT-eWQX compatible EDDs.
- Data recorded in the field may include station information (such as latitude, longitude, and station name), visit information (such as date, time, and personnel), instantaneous field measurements, and habitat assessments.

1.4 DOCUMENT PURPOSE

This guidance manual describes the procedural and formatting requirements for submitting EDDs to DEQ for storage in DEQ's MT-eWQX database. This document contains five main sections:

1. **Prepare for EDD Development** covers the initial steps needed to prepare for the process of developing, validating, and submitting an EDD to MT-eWQX.

2. **EDD Development** describes in detail the formatting requirements for each of the EDD worksheets, including naming conventions and other guidance where applicable.

3. **Quality Control** provides instructions for data providers to perform quality control reviews of their data to detect and fix errors and to qualify results as necessary.

4. **EDD Validation** describes using the EQuIS Data Processor (EDP) application to screen for and correct formatting errors prior to submitting an EDD.

5. **EDD Submittal** covers the process for submitting a validated EDD to DEQ and introduces the MT-eWQX Submittal Form and the required data package.

Figure 2 shows and overview of the EDD Submittal Process detailed in this document. All MT-eWQX materials referenced in this guidance manual are available from DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw under the heading *Submit Data*.

For questions and support with EDD development, verification and submittal, contact DEQ's Water Quality Data Manager, Deanna Tarum, at dtarum@mt.gov.

Initial Set-up Only

1. Download MT-eWQX EDD and Guidance Manual

2. Download and Install the EQuIS Data Processor (EDP)

Register EDP (data provider will receive email containing EDP registration key)

EDD Submittal Process

Gather project data

Complete the relevant worksheets in the MT-eWQX EDD

Load the EDD file into the EDP (refer to EDP Guidance Manual)

Use EDP to correct all errors

Complete MT-eWQX Submittal Form

Email error-free EDD, SAP, and Submittal Form to deqmtewqx@mt.gov

Does EDD pass DEQ review?

— Yes → DEQ loads data and sends final EDD and submittal form to data provider → If under contract, data provider submits completed submittal form and invoice to DEQ PM

No → DEQ sends corrections to data provider → Make corrections and resubmit to DEQ
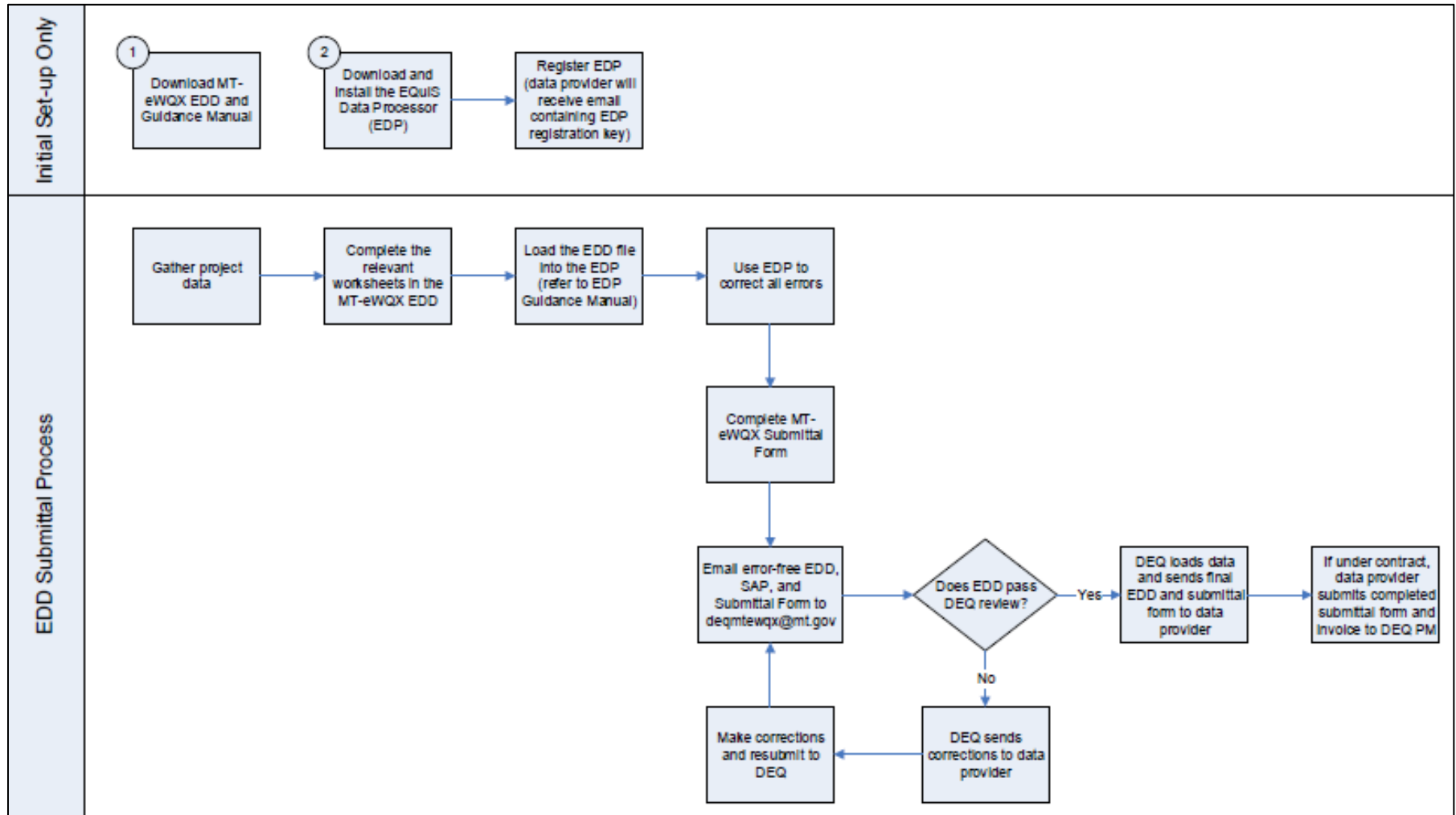
Figure 2. Electronic Data Deliverable (EDD) Submittal Process *(figure revised 1/21/22)*

2.0 PREPARE FOR EDD DEVELOPMENT

This section helps data providers prepare for the process of developing, validating, and submitting an EDD so they can improve efficiency and minimize errors. Before developing their EDD, data providers should first compile all the resources they will need throughout the process, orient themselves with the expected final product, and understand the formatting requirements they must adhere to.

2.1 COMPILE DATA AND REFERENCES

Before beginning to populate an EDD with project data, data providers should compile all the resources that will be needed during EDD development:

MT-eWQX Guidance Manual
Describes the procedural and formatting requirements for formatting, validating, and submitting EDDs to MT-eWQX. Available at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw.

Blank MT-eWQX EDD
Excel workbook comprised of multiple worksheets that are used as a template to create a properly formatted EDD for submittal of data to DEQ's MT-eWQX database. Data providers must download the blank EDD template and populate it with project data for submittal to DEQ. Available at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw.

MT-eWQX Reference Values table
The Reference Values table contains the valid values which data users must select from to populate certain controlled fields in the EDD for which valid values are required. Available at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw.

EQuiS Data Processor (EDP) Guidance Manual (**Attachment A**)
Instructs data providers on how to use the EQuiS Data Processor (EDP) application to detect and correct EDD formatting errors during EDD validation prior to submittal (**Section 2.2 and 5.0**). Available at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw.

Field forms
Data providers should compile and organize all field forms (hard copy and/or electronic) used to record information in the field that is to be included in an MT-eWQX EDD submission. This may include station information, site visit information, and field measurements. DEQ recommends scanning hard copy field forms for electronic archiving.

EDDs from analytical laboratories or biological contractors
When environmental samples are sent for analysis at a professional laboratory, the analytical laboratory or biological contractor returns an EDD containing analytical results. To streamline data entry and minimize reformatting, DEQ recommends that data providers confirm in advance that the laboratories or biological contractors providing analytical services for them will provide EDDs that meet DEQ's MT-eWQX formatting requirements. If the data provider received multiple EDDs for the project (e.g., a separate EDD for each sampling event conducted throughout a field season), DEQ recommends compiling all EDDs into a single Excel file for ease of data entry during EDD development. Some

analytical laboratories or biological contractors may, upon request, provide a single comprehensive EDD for a defined time period (e.g., an entire field season).

Sampling and Analysis Plans (SAPs)
SAPs are used to communicate project specifications and data quality requirements with field and lab personnel. SAPs contain logistical and analytical details about a specific monitoring effort including objectives, sampling locations, schedule, number and type of samples per site visit, protocols, sample preservation and handling requirements, analytical methods, and reporting requirements. SAPs are required for data collected by or for DEQ; alternate forms of documentation may be accepted on a case-by-case basis.

QA/QC Records
Data providers should compile any records that could inform QC review and data validation. This may include QA/QC summary reports from analytical labs, results from QC samples, calibration logs for field instruments, records describing deviations from SAPs, etc.

2.2 DOWNLOAD AND INSTALL THE EQUIS DATA PROCESSOR (EDP)

The EQuIS Data Processor (EDP) is a standalone application that performs a series of formatting checks on the EDD to identify records that have errors. Data providers must use the EDP to check their MT-eWQX EDD for errors, and correct all errors that are identified, prior to submitting their EDD to DEQ (**Section 5.0**). Data providers are encouraged to install and register the EDP application at least several days in advance of needing to use it as there may be lag time during the EDP registration process. Follow the detailed instructions to install and register EDP contained in the EDP Guidance Manual (**Attachment A**) from DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw in this order:

1. Download and install the EDP application
2. Download the Montana DEQ Format
3. Download the Montana DEQ Reference Values
4. Register the EDP Application

NOTE: Before using EDP to validate an EDD, users must ensure that they have installed the most current version of EDP and downloaded the most current versions of the MT-eWQX Format and MT-eWQX Reference Values files that EDP references.

2.3 UNDERSTANDING THE EDD

The MT-eWQX EDD is an Excel workbook that is comprised of five worksheets:

1. **Project**: Describes a particular study or data collection effort.

2. **Stations**: Describes monitoring locations where data are collected.

3. **Activity**: Describes activities conducted at monitoring locations which result in data (e.g., routine sample collection, quality control sample collection, and field measurements).

4. **Result**: Describes the results produced by data collection activities, such as analytical results from samples analyzed at a laboratory, field measurements, and observations.

5. **Attached Documents**: Allows for one or more documents to be attached to the EDD to provide additional context for projects, monitoring locations, activities, or results (e.g., QAPPs and SAPs).

Data providers may manage their data in any acceptable software tool for editing and formatting data such as a spreadsheet or database. However, when data is submitted to DEQ, it must follow the required MT-eWQX EDD Format.

NOTE: Data providers are strongly encouraged to include all the data for a project into a single EDD when submitting data to MT-eWQX. For example, a data provider may submit one EDD annually comprised of all the data collected for a project throughout the entire field sampling season. This streamlines EDD validation and submittal for all parties involved.

2.4 EDD FORMATTING REQUIREMENTS

Before beginning to compile their EDD, data providers are encouraged to acquaint themselves with each worksheet and the fields therein (especially those that are required). **Appendix A** contains a Format Description Table which specifies the formatting requirements for each field in each worksheet of the EDD. The column headings and descriptive text rows below the column headings in the EDD worksheets similarly indicate to data providers the type of data and format required for each field (e.g., fields that are red and bold font are required, fields that are blue are conditional). Data providers are responsible for enforcing these requirements. Deviations from the formatting requirements will result in errors during EDP validation and submittal.

The Format Description Table contains five elements:

1. **Column #:** Indicates column placement in the worksheet. It is very important to not remove or change the order of any columns in the EDD.

2. **Column Name:** Name of the column heading (field) in the EDD.

3. **Data Type:** Indicates the type of data required for the field (**Table 1**).

Table 1. Data Type Descriptions

Type	Description	Comments
Boolean	Enter either Y or N	Indicates yes or no.
Date	MM/DD/YYYY date format	Example: 03/20/2009
Numeric	Either decimal or integer (whole number)	Decimal precision indicated in parentheses in Data Type column.
Text	Characters and numbers	Length restrictions (character limits) are indicated in parentheses in Data Type column.
Time	24-hour (military) HH:MM time format	Example: 16:30
Valid Value	Requires a valid value from the MT-eWQX Reference Values table.	Data providers must look up and select from the list of reference values (valid values) for that data element.

4. **Required:** Indicates whether the data element is required, conditional, or optional. All fields marked as "Required" must be filled in. Fields marked as "Conditional" are required if certain business rules are met as indicated in the Description column. Fields marked as "Optional" are not required, but data should be reported if available. When a field is not required and no data is available, the field should be left blank.

5. **Description:** Describes the data element and any applicable business rules.

NOTE: Certain key fields appear in more than one worksheet and it is <u>very</u> important that they match exactly in each worksheet they appear so that associated information is correctly linked across worksheets. For example:

- "Project_ID" field appears in both the Project and Activity worksheets.

- "Station_ID" field appears in both the Station and Activity worksheets.

- "Activity ID" field appears in both the Activity and Result worksheets.

2.5 VALID VALUES (AKA REFERENCE VALUES)

Valid values, also known as reference values or domain values, govern the contents of some fields in the EDD. Data elements (fields) with data type "valid value" in the Format Description Table in **Appendix A** must be populated with a value that matches exactly a value for that data element in the Reference Values table available at DEQ's MT-eWQX Support website at https://deq.mt.gov/water/Programs/sw.

If data providers cannot identify a suitable value in the MT-eWQX Reference Values table, they can request that a new valid value be added by submitting a valid value request via email to MontanaEQuIS@mt.gov. In the email, data providers should include:

1. The name of the field for which a new value is being requested.

2. The proposed value name.

3. A brief description of the meaning of the value.

If the newly requested valid value is accepted, DEQ will update the Reference Value table and will notify the data provider when an updated version of the Reference Value table has been posted to the EDP Download webpage available via the "Download EDP" link at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw. This updated Reference Value table will allow the EDP to recognize the new value as valid and data providers must download this newest table prior to using EDP to check their EDD.

2.6 JOIN THE MT-EWQX LISTSERV (OPTIONAL)

Data providers may opt to register for the MT-eWQX ListServ if they wish to receive updates including anticipated outages for maintenance, notices that updated reference value lists are available, and training opportunities. To register for the MT-eWQX ListServ:

- Visit DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw and click on "Subscribe: MT-eWQX ListServ".

- Select Subscription Type and enter email address or wireless number, then click "Submit".

- Check the box to consent to the privacy policy and click "Submit".

- Click on the link in the confirmation email to confirm the new subscription.

3.0 EDD DEVELOPMENT

This section describes each worksheet of the EDD, including formatting requirements and naming conventions.

3.1 PROJECT WORKSHEET

The Project worksheet is used to establish new projects in MT-eWQX. Formatting requirements for the Project worksheet can be found in the Format Description Table in **Appendix A.** Projects describe a particular study or data collection effort. Some projects span multiple years while others are shorter in duration. Project objectives typically remain relatively constant even if sites or parameters vary slightly through time.

Project ID

A Project ID is a unique identifier for a specific data collection effort. If the project for which data is being submitted already has a Project ID established in MT-eWQX, the Project worksheet can be left blank as this information does not need to be resubmitted. If a project does not have a Project ID, or if the data provider is unsure of whether a Project ID already exists, they must create one. Project IDs (*maximum 35 characters*) do not have a required naming convention, although DEQ recommends the following:

- Avoid including the year in the Project ID so that a single Project ID remains relevant for projects that span multiple years (for easier batch data retrieval), unless there is a strong rationale for establishing a discrete Project ID.

- Keep it simple and use intuitive abbreviations. Because the character limit is not overly restrictive, it is not necessary to over-abbreviate. Project IDs that are sufficiently descriptive enable data end users to identify and distinguish between data collection efforts more easily.

- Include the name of the watershed or waterbody that is the subject of the study, the name of the monitoring program, and/or the focus of the study.

- Avoid spaces; use hyphens or underscores instead.

Table 2 includes examples of informative Project IDs and Project Names.

Table 2. Examples of Project IDs and Names

Project ID	Project Name
ADOPTALAKE	Clearwater Resource Council Adopt-A-Lake Volunteer Monitoring Program
BHRA-BIGHORN	Big Horn River Alliance Water Quality Sampling
LB-LAKE	Little Bitterroot Lake Eutrophication Study
MVWQD_VM2020	Missoula Valley Water Quality District Volunteer Monitoring 2020

NOTE: Project managers may find it helpful to create a Project ID in advance of data submittal for inclusion in QAPPs, SAPs, or other project documentation throughout the lifespan of the project.

NOTE: Upon receipt of an EDD, DEQ's Water Quality Data Manager may change the Project ID if they determine that an established Project ID already exists for the project or if the Project ID created by the

data provider was otherwise insufficient. The Project ID ultimately included in the MT-eWQX will be indicated in the final EDD returned to the data provider for their records.

Project Name

Project Name (*maximum 120 characters*) is a concise name assigned to a project and may, for example, resemble the title of a project plan or SAP.

Project Description

Project Description (*maximum 1999 characters*) is a brief narrative synopsis of the primary goals or objectives of the project. Project descriptions may include information such as a description of the project area, a list of project goals and objectives, and/or an indication of the data types to be collected. Project description may be pulled from project plans or SAPs if available.

3.2 STATIONS WORKSHEET

Formatting requirements for the Stations worksheet can be found in the Format Description Table in **Appendix A.** Stations are locations where data are collected, also commonly called monitoring sites. Monitoring sites are proposed in a project's SAP, although the exact latitude and longitude coordinates where data collection occurs in the field may vary from these proposed sites, for example, if field personnel shift slightly upstream or downstream to ensure safe access or site representativeness. The actual latitude and longitude coordinates of stations are recorded on field forms at the time of data collection. The Stations worksheet is used to establish new stations when data collected at those sites are being submitted to an MT-eWQX organization (**Section 1.2**) for the first time. MT-eWQX will already have established stations for locations where data has been submitted previously, including 1) Station ID, 2) Station Name, 3) Station Description, and 4) latitude and longitude coordinates.

To avoid redundancy, before submitting new stations in the Stations worksheet, data providers should query the MT-eWQX organization to which they are submitting data to identify whether their monitoring sites are already established MT-eWQX stations. Data providers that are knowingly submitting data collected from an established station within the same MT-eWQX organization should not resubmit these stations. They should exclude the existing stations from the Stations worksheet of their EDD and should use the previously established Station IDs when filling out the Activity worksheet. When submitting data from new sites which do not already have Station IDs established within the same MT-eWQX organization they are submitting data to, data providers must fill out all required fields in the Stations worksheet for those new stations.

NOTE: External data providers submitting data to MT-eWQX should not use the Station IDs established by DEQ (e.g., example format M06CABNC01) even if data was collected at the same locations. Instead, they should create their own or use a Station ID that was established within the organization they are submitting data to for that site if one already exists.

NOTE: If data was collected at a monitoring location that is in very close proximity to an established station and they have reason to believe the existing station is adequately representative of their actual monitoring location, data providers or DEQ's Water Quality Data Manager may on a case-by-case basis decide to submit the data using the established Station ID. Typically, if a prominent feature (e.g., a tributary confluence, point source discharge, obvious groundwater inflow or outflow, etc.) is between

the two locations, a new station should be created. It is best to consult with the project manager who selected the sites for the study to ensure the correct decision is made.

Station ID

Station IDs (*maximum 20 characters*) are unique identifiers for monitoring locations and are associated in MT-eWQX with accompanying site information such as station name, description, and other fields. They are often used as convenient shorthand for identifying sites on field forms and sample bottles. The two key components of Station IDs are waterbody and location. While there is no required naming convention for Station IDs, data providers should consider the following Station ID naming guidance:

- Do not include spaces; use hyphens (preferred) or underscores to visually separate elements if needed.

- Include the entire waterbody name or an intuitive abbreviation; include an abbreviation to signify waterbody type: R - River, C - Creek, G - Gulch, L - Lake, P - Pond.

- Include intuitive location descriptors to help distinguish between sites on the same waterbody (e.g., consider spatial factors such as headwaters, mouth, above or below tributary confluences, nearby geographic landmarks, road crossings, etc.).

- Use words rather than numbers to distinguish between sites more descriptively (e.g., -MOUTH and -HDWTR rather than -01 and -02).

- Can use uppercase and/or lowercase.

NOTE: Upon receipt of an EDD, DEQ's Water Quality Data Manager may change Station IDs if they determine that an established Station ID already exists in the same organization or if the Station IDs created by the data provider were otherwise insufficient. The Station IDs ultimately included in the MT-eWQX will be indicated in the final EDD returned to the data provider for their records.

NOTE: Data providers may opt to identify existing stations and create new Station IDs in their project SAPs prior to data collection ahead of time convenience and efficiency.

Station Name

Station Name (*maximum 80 characters*) should spell out the waterbody name plus include a brief description of the station's location (e.g., "Boulder River downstream of Hwy 87 bridge"). If a waterbody is qualified by a fork (e.g., North Fork) or a cardinal direction (e.g., South), the waterbody name should come before the qualifier to aid in data sorting (e.g., "Flathead River North Fork" is preferred over North Fork Flathead River").

Station Description

Station Description (*maximum 255 characters*) is an optional, more detailed description of the station. Station descriptions are often used to provide clarifying information regarding directions to find the station or other site specifics that may not otherwise be obvious (e.g., distance upstream or downstream from an easily identifiable landmark).

Table 3 includes examples of Station IDs, Station Names, and Station Descriptions. Latitude and longitude coordinates are not included in these examples but must be recorded for each station in the Station worksheet using decimal degrees format (XX.XXXXX, -XXX.XXXXX). During QC review (**Section 4.0**), data providers are instructed to map station coordinates to verify location is correct.

Table 3. Examples of Station IDs, Names, and Descriptions

Station ID	Station Name	Station Description
GGWC-EGAL01	East Gallatin River at Griffin Drive	North side of Griffin Drive, across from Story Mill property driveway
GGWC-MTWBC02	Matthew Bird Creek at Peace Pipe Drive	Downstream of Peace Pipe Drive at the Sundance Springs Trailhead
CLARKSFK-CARLSON	Clarks Fork Yellowstone River at Carlson Bridge	Downstream from Belfry
JackC-JCR	Jack Creek at Jack Creek Ranch	Less than 1 mile upstream from confluence with Madison River

3.3 ACTIVITY WORKSHEET

Formatting requirements for the Activity worksheet can be found in the Format Description Table in **Appendix A.** The Activity worksheet is used to record the types of activities that were conducted at monitoring stations during each site visit (sampling event) that resulted in data. Examples of activities include routine sample collection, duplicate or blank (QC sample) collection, field measurements, and habitat assessments.

Only include activities in the Activity worksheet that have results associated with that activity reported in the Result worksheet of the same EDD. Using field forms and lab EDDs for reference, populate as many rows as necessary to identify which type of activities were performed during each unique site visit. For example, if during a single site visit, water samples, field duplicate QC samples, chlorophyll-a samples, and field measurements were all completed, four Activity IDs would need to be created for that site visit.

Activity ID

Activity IDs are unique identifiers that group together activities of the same type and sample medium conducted during a sampling event (i.e., same date, time, and place). The Activity ID is one of the most important key fields in the EDD because it associates the metadata entered into the Activity worksheet with the associated results in the Result worksheet. Within the organization that data is being submitted to, the Activity ID must be unique for each Activity Type, Medium, Date/Time, Sample Collection Method, and Depth.

The required naming convention for Activity IDs is as follows (*maximum 35 characters*):

> **[Station ID]_[Activity Date]_[Activity Type]**

- Station ID: May use the full Station ID or an abbreviation if necessary to maintain the character limit.

- Activity Date: MMDDYYYY date format is preferred

- Activity Type: Use the Activity Type valid values or an acceptable abbreviation if necessary to maintain the character limit (e.g., shorten "S-ROUTINE" to "S-R", "QC-FB" to "FB", "QC-FD" to "FD", and "F-MSR/OBS" to "F").

Two additional elements must be added to the Activity ID if applicable:

[Station ID]_[Activity Date]_[Activity Type]_[Medium](Sequential #)

- Medium: Only applicable if samples from more than one sample medium are collected during a sampling event; add "-[Medium]" after Activity Type to distinguish which sample medium is being referenced; default without medium indicated assumes water sample unless a medium code is added to indicate otherwise (e.g., -C for chlorophyll, -SED for sediment, -M for macroinvertebrates).

- Sequential #: Only applicable if more than one sample, measurement, or observation of the same type is made during a single sampling event; add a sequential number in parentheses after medium to distinguish between samples (e.g., C(1), C(2), C(3), and so on, for multiple chlorophyll-a samples collected during a site visit).

Examples if the following activities were conducted at station BEAVR01 on 7/08/21:
- Field measurements: BEAVR01_07082021_F
- Water samples: BEAVR01_07082021_S-R
- Chlorophyll samples: BEAVR01_07082021_S-R_C
- Field blanks (water): BEAVR01_07082021_FB
- Field duplicates (water): BEAVR01_07082021_FD

NOTE: It is very important that the Activity IDs that appear in the Activity worksheet match exactly with the Activity IDs that appear in the Results worksheet or the EDP validation will result in an error and important metadata will not be properly linked with results.

NOTE: If Excel's concatenate function is used when creating Activity IDs, ensure that the resulting values are copied and pasted as values into the EDD Activity ID field to replace the concatenate equation before submittal.

NOTE: Time is not an element included in the required Activity ID naming convention. If a data provider believes there is a strong rationale for including time in Activity IDs, they should consult with DEQ's Water Quality Data Manager.

3.4 RESULT WORKSHEET

Formatting requirements for the Result worksheet can be found in the Format Description Table in **Appendix A.** The Result worksheet is used to enter results for various characteristics (parameters):

- For analytical results from samples analyzed by a laboratory or biological contractor, the data provider should receive an EDD which matches the columns and formatting of the MT-eWQX EDD, allowing for easy copying and pasting to populate this data into the Result worksheet. **NOTE**: To streamline data entry and minimize the need for manual reformatting, DEQ recommends that data providers confirm in advance that the labs they plan to use are willing and able to provide EDDs that meet MT-eWQX formatting requirements. DEQ provides guidance to labs as they set up MT-eWQX compatible EDDs.

- For instantaneous measurements or other data recorded by field personnel, populating the Result worksheet typically requires manual data entry to transcribe data from field forms or notebooks.

To detect and control errors and ensure accurate data is being migrated into MT-eWQX, data providers are required to perform QC checks of their raw data and EDD to per **Section 4.0** prior to submittal.

NOTE: Results submitted to MT-eWQX must have an associated Activity ID reported in the Activity worksheet of the same EDD (**Section 3.3**).

3.5 ATTACHED DOCUMENTS WORKSHEET

Formatting requirements for the Attached Documents worksheet can be found in the Format Description Table in **Appendix A.** The Attached Documents worksheet allows for multiple documents to be attached to projects, monitoring locations, and activities. The project's QAPP and/or SAP are added to this worksheet. The Result worksheet (field "Result_File_Name") can be used to associate attached documents to specific results, if needed.

3.6 DATA LOGGER RESULTS

Data logger results can be entered into MT-eWQX by uploading a text file (.txt) instead of entering individual results. To enter data logger results into the MT-eWQX EDD:

1. Use the MT-eWQX Data Logger Template available DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw to format the data logger results.

2. Save the "Final" worksheet in the template as a tab-delimited text file.

3. In the Activity worksheet, create one Activity for each data logger; use Activity Type "F-DL."

4. In the Result worksheet, enter one row for each Activity ID. Enter only the first row of data for each activity ID from the data logger file. Key fields to populate in the Result worksheet are:

   - Data_Logger_Line_ID: 1

   - Result Comment: "See attached text file for complete data logger results."

5. In the Result worksheet, populate the "Result_File_Name" field with the complete data logger text file name.

6. When ready to submit the data, include all the data logger text files into submittal package with the EDD and submittal form.

7. On the MT-eWQX Data Submittal Form, in the "Type of Data Submitted" section, check the "Results (data loggers)" box.

3.7 HABITAT ASSESSMENT FORMS

Habitat assessment forms can be submitted to MT-eWQX by uploading an electronic version of the form. To enter habitat assessments into the MT-eWQX EDD:

1. Create one Activity for each habitat form. Key fields to distinguish it as a habitat activity are:

   - Activity Type: F-HA (This activity type does NOT require a Sample Collection Method.)

   - Medium: Habitat

   - Medium Subdivision: NA

2. In the Attached Documents worksheet, enter the habitat form file information. Required fields are:

- File Name: Enter the complete habitat file name, including file extension (PDF is the preferred file type, although other file types will be accepted).

- File Extension: Enter the file extension, usually ".pdf".

- File Type: Activity_ID

- File Type ID: Enter the Activity ID created for the habitat form in the Activity worksheet.

3. When ready to submit the data, include all the habitat documents into the submittal package with the EDD and submittal form.

- On the MT-eWQX Data Submittal Form, in the "Type of Data Submitted" section, check the "Activities (habitat forms)" box.

4.0 QUALITY CONTROL

To detect and control errors and to ensure accurate data is being migrated into MT-eWQX, data providers are required to perform quality control (QC) checks of their raw data and EDD. For questions and support with the QC tasks described in this section, contact DEQ's Water Quality Data Manager, Deanna Tarum, at dtarum@mt.gov.

4.1 Review the EDD for Errors

Data providers are responsible for reviewing their EDDs:

- Review field forms to identify errors and make corrections. It is advisable to distinguish between original text and subsequent corrections, for example, by making corrections in ink if pencil was used by field personnel.

- Complete any necessary manual calculations (e.g., discharge, slope).

- Map station latitude/longitude to verify location is correct (e.g., station appears on the correct waterbody and in the correct place). Compare station locations to existing stations in same WQX organization before assigning new Station IDs (**Section 3.2**).

- Review data for obvious errors and outliers.

- Ensure all values are numeric.

- Ensure the data matches the specifications in the SAP. For example, verify:

  o Characteristics match the parameters planned for collection,

  o Sample fraction is correct (e.g., total recoverable versus dissolved),

  o Result value units are correct.

  o Lower reporting limits (LRLs) meet the required reporting limit (RRL),

  o Analytical method matches the lab report and the SAP analytical table,

- Verify activity start dates and times match the dates and times on corresponding field forms.

- Verify activity type correctly identifies field duplicates (QC-FD) and field blanks (QC-FB).

- Calculate the dilution factor for each dilution (i.e., divide reported LRL by analyte's standard LRL) and fill in dilution factor field.

- Ensure reported values have same number of decimal places as the LRL (limit the result to three significant figures).

- Ensure that each parent-duplicate pair has a comment added to the Result Comment field to distinguish duplicates (i.e., "parent to…" and "duplicate to…").

- Verify that cooler temperatures were at or below the holding temperatures specified in the SAP (reported in the lab QC report, work order checklist, and/or field forms). If coolers are over temperature, indicate the temperature in result comments.

- If benthic algae ash-free dry weight data is included in the EDD, delete ash-free dry weight results for core samples from the EDD.

- Ensure the result value field does not show "ND"; it must be blank for result values that are not detected.

4.2 Add Result Qualifiers

A standard set of result qualifiers (also called data flags) are used to provide additional information about individual results as needed (**Table 4**).

Table 4. Result Qualifiers

Result Qualifier	Description
B	Detection in method or field blank.
D	Contract Required Quantitation Limit not met due to sample matrix interference, dilution required.
H	Holding time exceeded.
J	Estimated: The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample.
L	Lowest available reporting limit for the analytical method used
R	Rejected: The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
U	Not Detected: Analyzed but not detected at a level ≥ the level of the adjusted Contract Required Quantitation Limit for sample and method.

Labs will typically provide a QA/QC summary report and will assign some necessary result qualifiers:

- Qualify when dilutions were performed (D flag).

- Qualify when holding time was exceeded (to the minute) (H flag).

- Qualify as estimates all result values that are greater than the MDL and less than or equal to the LRL (J flag); result comment "Result between MDL and LRL, J flagged as estimate."

- Qualify when the lowest LRL they could achieve is higher than the RRL in the SAP (L flag).

- Identify detections in blank samples (lab does not add B flags; see below).

- Distinguish between duplicate and routine sample pairs.

- Indicate in the QA/QC summary report the temperature of each cooler measured upon receipt of samples.

- Indicate in the QA/QC summary report instances when lab QC samples (laboratory control samples, blanks, duplicates, matrix spikes) were outside the required control limits.

Data providers are responsible for reviewing their EDD and adding result qualifiers, as needed, according to the following rules:

- Verify result qualifiers from the lab report were transferred to the EDD result qualifier field.

- Review the lab QC report to verify the lab QC samples were within the required control limits:

  o Method Blank: Result should be less than the project-required lower detection limit (LRL). If a method blank has a detect level at or above the LRL, then associated results up to or equal to 10x the detected value are "B" flagged with a Result Comment of "Method blank contamination, results <[x.xx] mg/l are B flagged." Non-detect result values are not flagged.

  o Lab Sample Duplicate: relative percent difference (RPD) should be less than the lab's established RPD limit. If it's exceeded, the associated results are "J" flagged with a Result Comment of "Lab duplicate RPD >25% (xx%)."

  o Matrix Spike/Matrix Spike Duplicate: RPD between the MS and MSD should be less than lab's established RPD limit. If it's exceeded, the associated results are "J" flagged with a Result Comment of "MS/MSD RPD >25% (xx%)."

  o Percent Recovery: The percent recovery for all lab samples, particularly the MS/MSD, should be within the low and high limits established by the lab. If it's outside of the limits, "J" flag the associated results that were detected (no qualifiers for non-detects) and add a Result Comment such as "MS/MSD failed [high or low] (xx/xx%), expect [high or low] bias."

NOTE: Associated results are those results that are the same analyte in the same lab batch number as the quality control sample.

- Verify that holding times met specifications of the SAP analytical table. Add H flags to samples that exceeded the holding time (if the lab didn't already do so). If soluble reactive phosphorus samples were automatically H flagged by the lab because they exceeded the 2-day holding time, remove the H flag if the samples were frozen immediately following collection and remained frozen until analyzed at lab, and were analyzed within the allowable 45-day holding time.

- If a field blank has a detection at or above the LRL, B flag associated result values that are ≤ 10x the detected value. Add the result comment, "Field blank contamination, results <x.xx mg/l are B flagged." Do not B flag the actual blank, only the samples associated with the blank. Do not flag non-detects. If the value detected in the blank is between the MDL and the LRL, J flag the result but it does not result in any other flags.

- If field duplicate result values are greater than 5 times the LRL, then the results should have a RPD ≤ 25%. If the field duplicates exceed 25% RPD, the duplicates and any associated results from that lab batch and same date are "J" flagged. Add the result comment such as, "(Associated) field duplicate RPD >25% (67%)." Non-detects are not flagged. If there is another duplicate on the same day that is within the control limits, only flag the parent and duplicate that are out of the limits.

- Add an R flag to any results that are rejected and should not be used for any purpose.

- Ensure total nitrogen (TN) results are greater than the sum of NO_{2+3} and NH_{3+4} results. Add a J flag if TN is more than 10% less than the sum of NO_{2+3} and NH_{3+4}.

- Ensure total phosphorus (TP) results are greater than soluble reactive phosphorus (SRP) results. Add a J flag if TP is more than 10% less than SRP.

- Ensure total metals results are greater than dissolved metals results for each analyte. Add a J flag if total is less than dissolved.

5.0 EDD VALIDATION

To ensure accurate data is being migrated into MT-eWQX, data providers are required to perform data validation using the EQuIS Data Processor (EDP) application. The EDP is a standalone application that must be used by data providers to check their EDD files prior to submission to ensure they are formatted correctly as described in this guidance manual. The EDP must be downloaded and installed (**Section 2.2**).

NOTE: Before using EDP to validate an EDD, users must ensure that they have installed the most current version of EDP and downloaded the most current versions of the MT-eWQX Format and MT-eWQX Reference Values files that EDP references.

After all the appropriate worksheets in the MT-eWQX EDD have been populated with project data, the EDD is ready for data validation. Detailed instructions for using the EDP to validate an EDP is available in the EDP Guidance Manual (**Attachment A**) available at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw. EDP will detect and identify errors, if present. All errors detected during data validation must be corrected prior to EDD submittal and can be corrected directly within the EDP. After the errors are corrected, the EDP must be re-run to ensure that no errors remain. An EDD must have a clean validation from the EDP prior to submission to MT-eWQX.

6.0 EDD SUBMITTAL

After an EDD passes through the EDP application error-free, it is ready to be submitted to MT-eWQX. Data providers must create the final data package and fill out an External MT-eWQX Submittal Form.

6.1 CREATE THE FINAL DATA PACKAGE

The data provider creates a final data package which consists of the error-free EDD workbook (.xls) and any documents referenced in the Attached Documents worksheet of the EDD. The EDD can be created manually, but the easiest (preferred) way to create the EDD is to save the EDD from EDP as an Excel file.

6.2 EXTERNAL MT-EWQX SUBMITTAL FORM

The External MT-eWQX Submittal Form must be submitted along with each EDD submitted to MT-eWQX. The submittal form includes information about the data submitter and about the data being submitted. The submittal form also requires data providers to confirm that the data passes QC requirements specified in the guidance manual, that the EDP was used to validate an error-free EDD, and that required project documents are being submitted along with the EDD.

Access the submittal form at DEQ's MT-eWQX support website at https://deq.mt.gov/water/Programs/sw. Fill in the required fields of the fillable form (.pdf) and save the file so it is accessible during the next step "Submitting EDDs to the MT-eWQX."

After the data in the EDD has been successfully migrated to MT-eWQX, DEQ will send the completed form back to the data provider as proof of submittal. The final submittal form acts as the contract deliverable.

6.3 SUBMITTING EDDS TO MT-EWQX

Email
Submit the EDD and associated required materials via email to DEQ's Water Quality Data Manager (Deanna Tarum) at deqmtewqx@mt.gov. Include as attachments to this email:

- The final, error-free EDD (Excel workbook, .xls)

- All documents referenced in the Attached Documents worksheet of the EDD (.pdf)

- The completed External MT-eWQX Submittal Form (.pdf)

If a file size limitation error is encountered when emailing, two alternative approaches for submitting EDDs and associated files to DEQ's Water Quality Data Manager are available: compressed files and File Transfer Service (FTS).

Compressed File
If a file size limitation error is encountered when emailing, an alternative approach for submitting the EDD and associated files to DEQ is to create and email a compressed (.zip) file. To compress files, select one or more files, right click, select "Send to," and select "Compressed (zipped) folder."
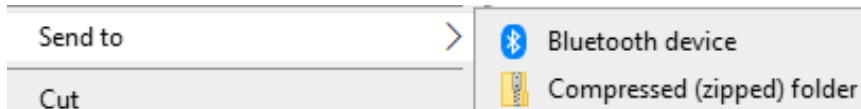

State of Montana File Transfer Service
If a file size limitation error is encountered when emailing, an alternative approach for submitting the EDD and associated files to DEQ is to use the State of Montana File Transfer Service (FTS). The FTS allows for easy transfer of large electronic files to and from customers of state government and is accessed via ePass Montana, the state's single login service.

To use FTS, data providers must first create an ePass Montana account if they do not already have one:

- Visit www.epass.mt.gov.
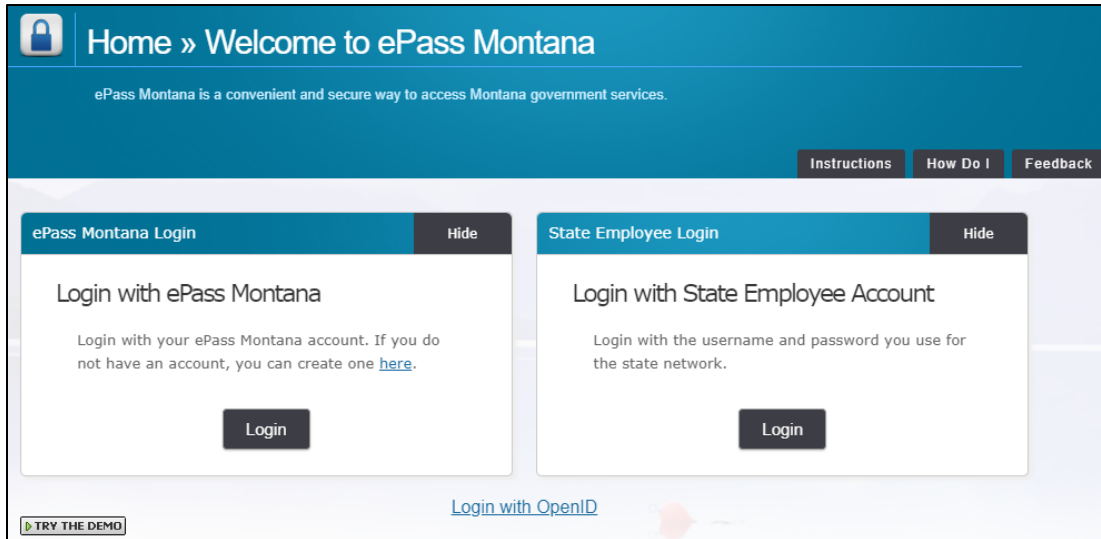
- Under Login with ePass Montana, select "If you do not have an account, you can create one here."

- Fill out all required fields for personal information, ePass Montana ID details (username and password), and security questions.

- After setting up an account, you will be taken to your customizable ePass page; add FTS to your new ePass Montana account.

- Enter the activation code that was emailed to you or select the link in the email to validate your email address. After your account is activated, you have full access to the FTS.

- Enter all required information including a username and password. **NOTE**: State of Montana employees log in with their state network login credentials and do not create an ePass Montana account.
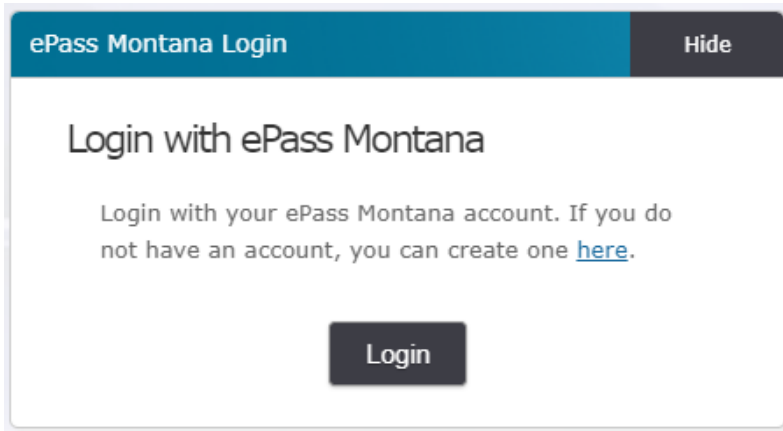
To use FTS to submit EDDs and associated files:
- Visit https://transfer.mt.gov
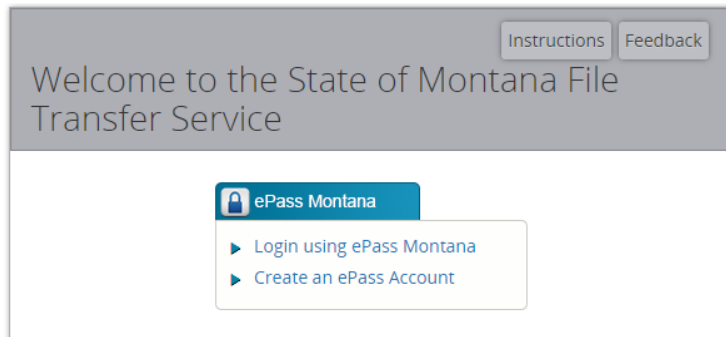
- Select "Login using ePass Montana." NOTE: State Employees select "Login using State Employee Account."
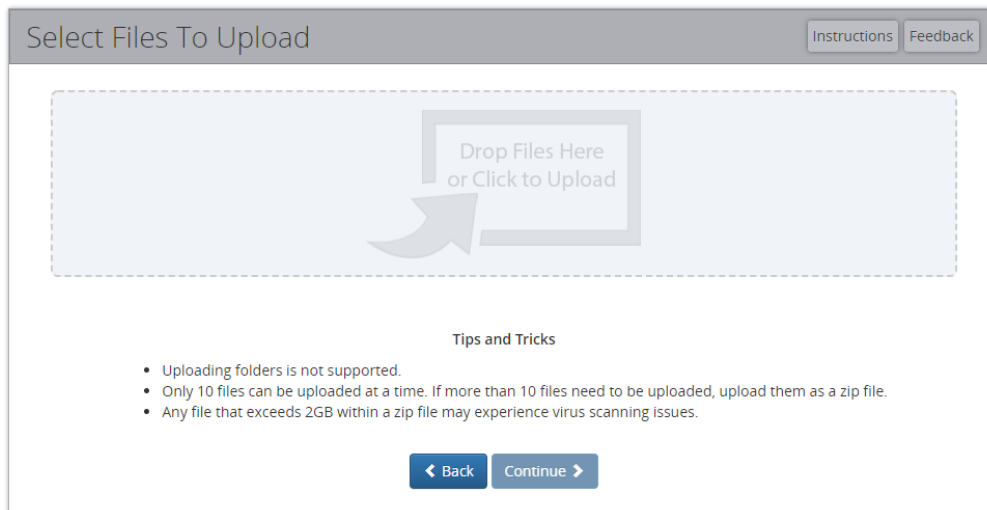
- Select "Login" and enter Username and Password.

- Select "Send a New File(s)"

- Locate the EDD and associated files to be submitted in your computer's file directory. Either drag and drop each file into the window provided, or "Click to Upload" then browse to each file and select "Open."
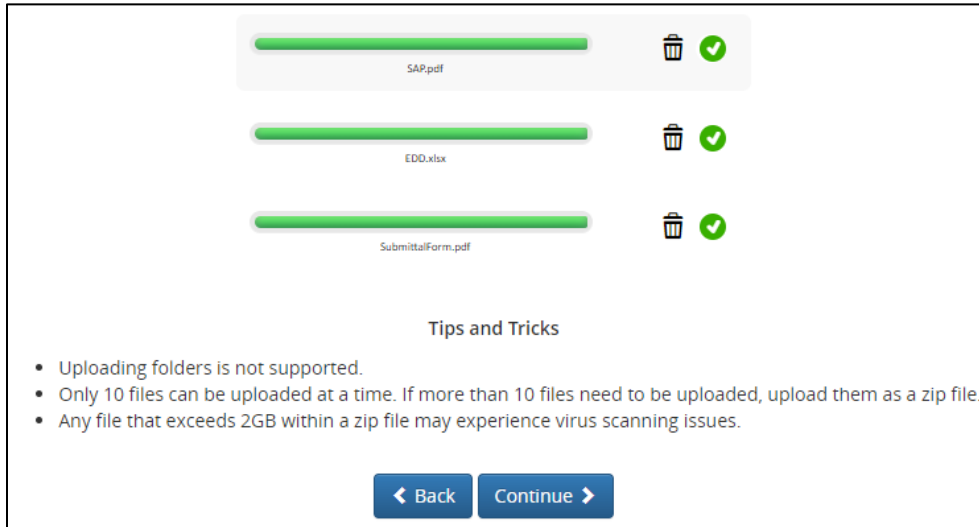
- Once all required files finish uploading, click "Continue."

- Select "State Employee of ePass Montana Customer"
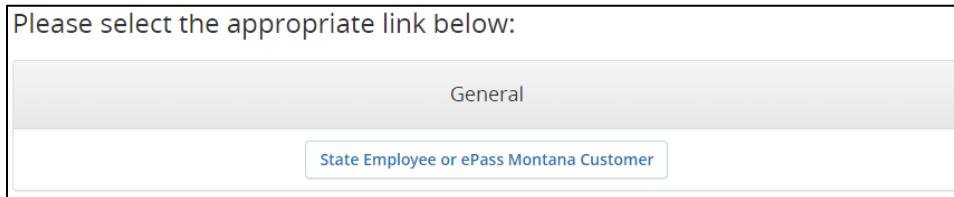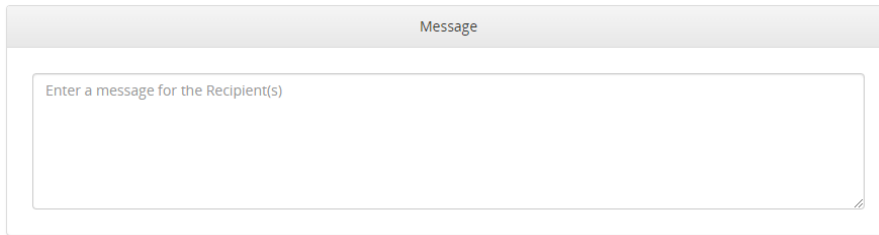
- Enter the Water Quality Data Manager email deqmtewqx@mt.gov in the email address box. **NOTE**: Data providers can alternately search for Deanna Tarum via "Find a State Employee," but the email provided above is preferred.
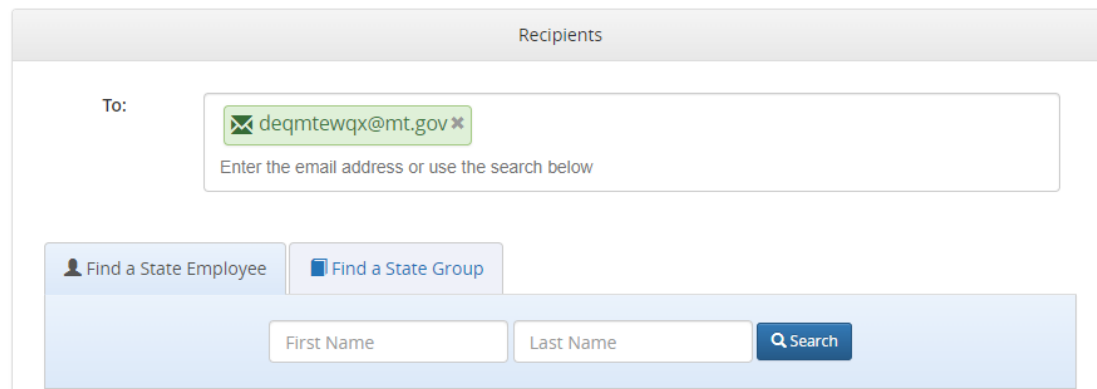
- Verify that all necessary files were uploaded. Go back to add more if necessary.
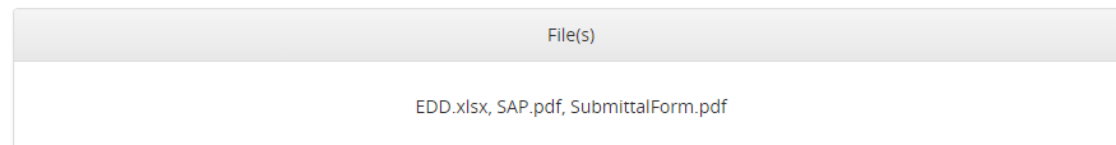
- Enter a message in the box provided.

Message
Enter a message for the Recipient(s)

- Click Send

6.4 CONFIRMATION

Upon receipt of the data package, DEQ's Water Quality Data Manager will:
- Verify that all required files were submitted.
- Import the EDD into the EDP application. If the EDD was checked in the EDP prior to submission, there should be no errors and the data should load into MT-eWQX successfully.
- Import the EDD into the EQuIS (MT-eWQX) database.

If errors are identified via EDP or during import into MT-eWQX, DEQ's Water Quality Data Manager will return the EDD to the data provider with an indication of what needs to be corrected. The data provider must correct errors and resubmit the EDD.

The Water Quality Data Manager will send the data provider an email confirming successful import into the database with the final EDD and the final MT-eWQX Data Submittal Form attached; this submittal form serves as proof that the data was loaded into MT-eWQX (e.g., can serve as a contract deliverable if applicable).

APPENDIX A - FORMAT DESCRIPTION TABLE

EDD Format Name: MTDEQ_WQX

Legend:

    Red + bold = Required

    Blue = Conditional

*Look up valid values in DEQ's MT-eWQX Reference Values table available on DEQ's MT-eWQX Support website at https://deq.mt.gov/water/Programs/sw.

Column	Column Name	Data Type*	Required?	Description
		PROJECT WORKSHEET		
A	**Project_ID**	*Text(35)*	Required	Unique identifier for a specific data collection effort.
B	**Project_Name**	*Text(120)*	Required	Name assigned to the project.
C	**Project_Description**	*Text(1999)*	Required	Description of the project; may include the project purpose or objectives.
D	**Project_Plan_Approved_Indicator**	*Text(1); Boolean (Y or N)*	Required	Indicates whether a project plan has been approved for the project.
E	Project_Plan_Approval_Agency	*Text(20); Valid Value*	Conditional	Required if Project Plan Approved is "Y". Authority that approved plan.
		STATIONS WORKSHEET		
A	**Station_ID**	*Text(20)*	Required	Unique identifier for a specific monitoring location.
B	**Station_Name**	*Text(80)*	Required	Name of waterbody including brief location description such as "near mouth".
C	Station_Description	*Text(255)*	Optional	Additional description of station.
D	Assessment_Unit_Code	*Text(50)*	Optional	Assessment Unit Code associated with stream reach where site is located.
E	Travel_Directions	*Text(255)*	Optional	Directions on how to locate station.
F	**Station_Type**	*Text(45); Valid Value*	Required	Type of monitoring location.
G	Station_Establishment_Date	*Date*	Optional	Date station was established (MM/DD/YYYY)
H	**Latitude**	*Numeric (Decimal) (12)*	Required	Latitude in decimal degrees.
I	**Longitude**	*Numeric (Decimal) (14)*	Required	Longitude in decimal degrees.
J	**Geopositioning_Method**	*Text(20); Valid Value*	Required	Method used to determine the lat/long.
K	**Geopositioning_Datum**	*Text(6); Valid Value*	Required	Datum used to determine the lat/long. MT DEQ standard is NAD83.

Column	Column Name	Data Type*	Required?	Description
L	Map_Scale	Numeric (Integer)	Conditional	Required if Geopositioning Method is "INTERPOLATION-MAP". Number that represents the proportional distance on the ground for one unit on the map.
M	Elevation	Text(12)	Optional	Ground elevation of location.
N	Elevation_Unit	Text(12); Valid Value	Conditional	Required if Elevation is reported. Units used in measuring. Use 'ft' or 'm'.
O	Elevation_Method	Text(20); Valid Value	Conditional	Required if Elevation is reported. Method used to determine elevation.
P	Elevation_Datum	Text(10); Valid Value	Conditional	Required if Elevation is reported. Datum used to determine elevation.
Q	**State**	Text(2); Valid Value	Required	State where station is located.
R	**County**	Text(25); Valid Value	Required	County name where station is located.
S	**HUC_8_digit**	Text(8); Valid Value	Required	8-digit USGS Hydrologic Unit Code where station is located.
T	HUC_12_digit	Text(12); Valid Value	Optional	12-digit USGS Hydrologic Unit Code where station is located.
U	Well_Type	Text(20); Valid Value	Conditional	Required if Aquifer Name or Formation Type is reported. Identifies the well type.
V	Well_Aquifer_Name	Text(20)	Optional	Name of aquifer well is in.
W	Well_Formation_Type	Text(20); Valid Value	Optional	Name of primary formation well is in.
X	Well_Hole_Depth	Numeric (12)	Optional	Depth of well hole.
Y	Well_Hole_Depth_Unit	Text(12); Valid Value	Conditional	Required if Hole Depth is reported. Units used in measuring. Use 'ft' or 'm'.
	ACTIVITY WORKSHEET			
A	**Project_ID**	Text(35)	Required	Unique identifier for a specific data collection effort.
B	Station_ID	Text(20)	Conditional	Required for most Activity Types. Refer to the Activity Type valid value list for activities that do not require a Station ID. Unique identifier for a specific monitoring location.
C	**Activity_ID**	Text(35)	Required	Unique identifier that groups together measurements, observations, or samples collected at the same date, time, place, and in the same medium.
D	**Activity_Type**	Text(70); Valid Value	Required	Type of activity.
E	Activity_Group_ID	Text(20)	Optional	Unique identifier that groups activities within an organization together.
F	Activity_Group_Name	Text(50)	Optional	Name associated with Activity Group.

Column	Column Name	Data Type*	Required?	Description
G	Activity_Group_Type	Text(30); Valid Value	Conditional	Required if Activity Group ID is reported. Identifies the type of activity grouping.
H	**Medium**	Text(10); Valid Value	Required	Environmental medium where measurements or sample was collected.
I	**Medium_Subdivision**	Text(10); Valid Value	Required	Subdivision of environmental medium.
J	**Activity_Start_Date**	Date	Required	Date measurements were taken (MM/DD/YYYY).
K	**Activity_Start_Time**	Time	Required	Time measurements were taken (HH:MM)
L	**Activity_Start_Time_Zone**	Text(4); Valid Value	Required	Time zone where measurements were taken. Use 'MST' or 'MDT'.
M	Sample_Collection_Method_ID	Text(20); Valid Value	Conditional	Required for some Activity Types. Refer to Activity Type valid value list for activities that require a Sample Collection Method. Unique identifier of method used to collect sample.
N	Sample_Collection_Equipment_Name	Text(30); Valid Value	Conditional	Required if Sample Collection Method ID is reported. Name of equipment used to collect sample.
O	**Activity_Conducting_Organization**	Text(20); Valid Value	Required	Name of organization or entity conducting the activity.
P	**Personnel**	Text(100)	Required	Name(s) of personnel conducting the activity. Format [First Name] [Last Name] with a slash (/) between multiple individuals.
Q	Activity_Comment	Text(2000)	Conditional	Required if Sample_Collection_Method_ID is "CHLPHL-CMP". Comments associated with the activity.
R	Activity_Relative_Depth	Text(15); Valid Value	Optional	Approximate location within water column where measurement occurred.
S	Activity_Depth	Numeric	Optional	Depth from surface to where activity measurements were taken.
T	Activity_Depth_Units	Text(12); Valid Value	Conditional	Required if Activity Depth is reported. Units used in measuring. Use 'ft' or 'm'.
U	Activity_Upper_Depth	Numeric	Conditional	Required if Activity Type is "Sample-Integrated Vertical Profile". May not exist if Activity Depth is reported. Upper vertical location of a vertical profile.
V	Activity_Upper_Depth_Units	Text(12); Valid Value	Conditional	Required if Activity Upper Depth is reported. Units used in measuring. Use 'ft' or 'm'.
W	Activity_Lower_Depth	Numeric	Conditional	Required if Activity Upper Depth is reported. Lower vertical location of a vertical profile.
X	Activity_Lower_Depth_Units	Text(12); Valid Value	Conditional	Required if Activity Lower Depth is reported. Units used in measuring. Use 'ft' or 'm'.
Y	Assemblage	Text(50); Valid Value	Conditional	Required if Medium is "Biological". Assemblage of organisms collected.
Z	Biological_Collection_Reach_Length	Numeric	Optional	Length of reach used for biological collection.

Column	Column Name	Data Type*	Required?	Description
AA	Biological_Collection_Reach_Length_Unit	*Text(12); Valid Value*	Conditional	Required if Biological Collection Reach Length is reported. Units used in measuring. Use 'ft' or 'm'.
RESULT WORKSHEET				
A	**Activity_ID**	*Text(35)*	Required	Unique identifier that groups together measurements, observations, or samples collected at the same date, time, place, and in the same medium.
B	Data_Logger_Line_ID	*Text(15)*	Conditional	Required if Activity Type is "F-DL" or "QC-DL". Unique line identifier from a data logger result file. Normally a date/time format or enter "1".
C	Biological_Intent	*Text(35); Valid Value*	Conditional	Required if any of the Biological fields are reported. Intent of biological monitoring. If Medium is "Tissue", Intent must also be "Tissue".
D	Biological_Taxonomic_Name	*Text(120); Valid Value*	Conditional	Required if Biological Intent is reported. Name of organism sampled.
E	Biological_Unidentified_Species_Name	*Text(120)*	Optional	Number or name of unidentified species. Must be used with a valid genus name in Taxonomic Name field.
F	Biological_Tissue_Anatomy_Name	*Text(30); Valid Value*	Conditional	Required if Medium or Biological Intent is "Tissue". Name of the anatomy from which a tissue sample was taken.
G	**Characteristic_ID**	*Text(15); Valid Value*	Required	Unique identifier of characteristic that was measured. Identifiers will be CAS, TSN, or other unique ID.
H	**Characteristic_Name**	*Text(120); Valid Value*	Required	Name of the characteristic that was measured.
I	Method_Speciation_Name	*Text(20); Valid Value*	Conditional	Identifies the chemical speciation in which the measured result is expressed. Common for nutrients.
J	**Sample_Fraction**	*Text(10); Valid Value*	Required	Some Characteristics require a valid Sample Fraction, the fraction of sample associated with results. Refer to the Characteristic valid value list. If a valid Sample Fraction is not required, 'NA' must be used; this field is required and cannot be left blank.
K	Result_Detection_Condition	*Text(35); Valid Value*	Conditional	Required if Result Value is not reported. Textual descriptor that explains why there is no result measure value reported. 'Not Detected' is the most common reason.
L	Result_Value	*Text(20) or Valid Value*	Conditional	Required if Result Detection Condition is not reported. Reportable value of measurement. Result Value must match a Choice List valid value if the Characteristic Name ends with the phrase "choice list".
M	Result_Value_Unit	*Text(12); Valid Value*	Conditional	Required if Result Value is a non-text result. Units used in measuring.
N	Result_Qualifier	*Text(5); Valid Value*	Optional	Identifies any qualifying issues that affect the result.

Column	Column Name	Data Type*	Required?	Description
O	**Value_Type**	*Text(20); Valid Value*	Required	Indicates type of value reported.
P	Method_Detection_Limit_Value	*Text(20)*	Optional	Value of method detection limit that was used for analysis.
Q	Lower_Reporting_Limit_Value	*Text(12)*	Conditional	Required if Activity Type requires an Analtyical Method or if Result_Detection_Condition is "Not Detected". Not required is Biological_Intent is reported. Lower reporting value.
R	Detection_Limit_Unit	*Text(12); Valid Value*	Conditional	Required if Lower_Reporting_Limit or Method_Deteciton_Limit are reported. Units used in measuring.
S	Laboratory_Name	*Text(20); Valid Value*	Conditional	Required if Activity Type requires an Analytical Method. Refer to Activity Type valid value list for activities that require an Analytical Method. Unique ID of laboratory responsible for result.
T	Lab_Sample_Prep_Method_ID	*Text(20); Valid Value*	Optional	Unique identifier of method used by lab to prep sample.
U	Analytical_Method_ID	*Text(20); Valid Value*	Conditional	Some Activity Types require a valid Analytical Method. Refer to the Activity Type valid value list. If a valid Analytical Method is not required, 'NA' can be used. Unique identifier of method used to obtain a result.
V	**Analysis_Start_Date**	*Date*	Required	Date when analysis began (MM/DD/YYYY). For field measurements, this would be the same as Activity Start Date.
W	**Analysis_Start_Time**	*Time*	Required	Time when analysis began (HH:MM). For field measurements, this would be the same as Activity Start Time.
X	**Analysis_Start_Time_Zone**	*Text(4); Valid Value*	Required	Time zone when analysis began. Use 'MST' or 'MDT'.
Y	Laboratory_Batch_ID	*Text(20)*	Optional	Batch ID assigned by lab.
Z	Laboratory_Sample_ID	*Text(20)*	Optional	Sample ID assigned by lab.
AA	Laboratory_Comment_Code	*Text(3); Valid Value*	Optional	Remarks provided by the lab.
AB	Result_Sampling_Point	*Text(12)*	Optional	Sampling point associated with result. If samples are associated with a stream transect, record transect here.
AC	Result_Depth_Height_Measure	*Text(12)*	Optional	Depth from surface to where result measurement was taken.
AD	Result_Depth_Height_Measure_Unit	*Text(12); Valid Value*	Conditional	Required if Result Depth Height Measure is reported. Units used in measuring. Use 'ft' or 'm'.
AE	Statistic_Type	*Text(20); Valid Value*	Optional	Statistical method used to calculate derived results.
AF	Weight_Basis	*Text(15); Valid Value*	Optional	Name that represents the form of the sample associated with the result. Commonly used for 'Weight' results.
AG	Particle_Size_Basis	*Text(15)*	Conditional	Required if Characteristic ID is like "PARTICLE". Particle size class associated with Particle Size results.

Column	Column Name	Data Type*	Required?	Description
AH	Precision_Value	Text(50)	Optional	Precision associated with result.
AI	Dilution_Factor	Numeric	Optional	Overall dilution of the substance analyzed.
AJ	Result_Comment	Text(2000)	Optional	Comments associated with the result.
AK	Result_File_Name	Text(255)	Optional	Complete file name, including extension, of document associated with this result.
ATTACHED DOCUMENTS WORKSHEET				
A	**File_Name**	Text(255)	Required	Complete file name, including file extension.
B	**File_Extension**	Text(6); Valid Value	Required	File extension (such as .pdf or .jpg).
C	**File_Type**	Text(50); Valid Value	Required	Data type file is associated with.
D	**File_Type_ID**	Text(50)	Required	Unique identifier file is associated with.
E	File_Date	Date	Optional	Date file was last modified (MM/DD/YYYY).
F	File_Title	Text(255)	Optional	Title of file.
G	File_Author	Text(255)	Optional	Author of file.
H	File_Comment	Text(2000)	Optional	Comments associated with the file.
I	File_Publisher	Text(64)	Optional	Publisher of file.